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Economic
Development
And Trade

Selecting a Small Business Computer System

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SELECTING A SMALL BUSINESS COMPUTER SYSTEM

Selecting the right computer system for a small business can be bewildering for those unfamiliar with this new technology. There are so many different systems available in today's marketplace that much forethought must be given before selecting a system.

This booklet is intended to assist the small business operator in developing a well-thought-out approach to computerization. It covers the steps that should be taken before a system is selected, as well as how to select, implement and operate the system.

"Selecting a Small Business Computer System" is one of a series of booklets published by Alberta Economic Development and Trade, Small Business and Industry Division. Other booklets that may be useful are:

- Starting a Small Business
- Financing a Small Business
- Marketing for a Small Business
- Operating a Small Retail Business
- Operating a Small Manufacturing Business
- Operating a Small Service Business
- Bookkeeping for a Small Business

These publications are available at all Economic Development and Trade Offices listed in the back of this publication.

NUMBER SEVEN OF A
SERIES COURTESY OF:

April 1989 - First Printing
Communications 8904 15M
ISBN 1-55006-182-8

Alberta
ECONOMIC DEVELOPMENT AND TRADE
Small Business and Industry Division

890926

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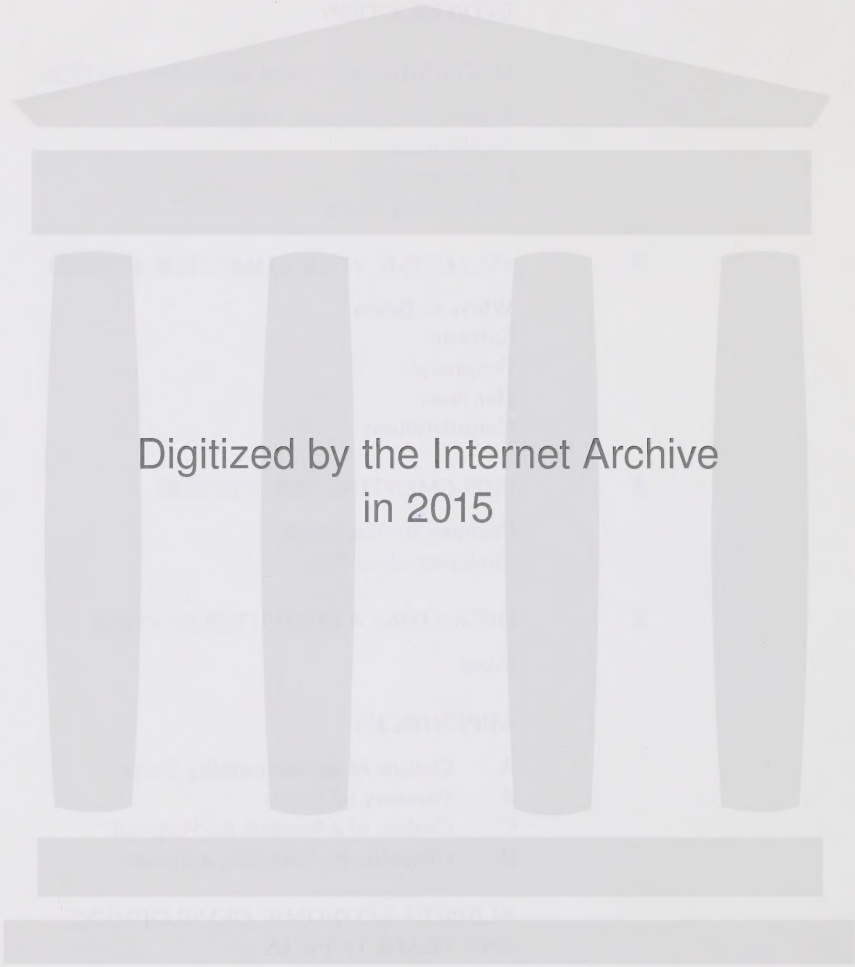
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INTRODUCTION

"The computer revolution is over. They won."

ADVANTAGES OF COMPUTER AUTOMATION

Computer automation is a fact of business life.

Given two competing businesses, equal in all aspects except for computer automation, the automated business will have a competitive advantage because of the following efficiencies:

- **Stabilized labour and overhead costs.**
  Computer operating costs are relatively constant compared with labour and allied costs. A well managed computer system can result in fewer administrative staff increases as the business grows.

- **Accelerated cash collections.**
  Computerized order management and accounts receivable can distinguish between good and weak credit customers, issue invoices and statements and provide more time to attend to bad accounts.

- **Reduction and control of inventories.**
  Computerized inventory control can distinguish between fast and slow moving items, identify obsolete items and improve re-order procedures.

- **Better customer services.**
  Computerized order management and inventory control can provide up to date order status information, accurate pricing and improved product delivery.

- **Accuracy in accounting.**
  Computerized accounting can reduce clerical errors and calculate extensions and summaries.

- **Timeliness in reporting.**
  Computerized business management can react quickly to changing business conditions through up to date financial, inventory, sales, work in progress and other analytic reports.

- **Improved forecasting and estimating.**
  Computerized business management can provide more up to date and accurate information, identify trends and improve forecasting techniques.

- **Improved secretarial tasks.**
  Computerized word processing can eliminate proof reading, customize documents, store and copy approved documents.

These efficiencies occur because computers are designed to be fast, accurate and versatile.

Computer automation, however, does not guarantee success.

In a recent survey of nearly 2,000 Canadian businesses, researchers discovered:

- Purchasers' expectations were often unrealistic.
- Purchasers often had no idea of the true costs of training.
- Purchasers expected staff to learn on the job and did not plan either formal training or upgrading.
- Hidden costs (such as supplies, education and training, etc.) could be 2-4 times greater than the initial purchase.
- Up to 80% of business expenditures on computers may be wasted.

This last concern raised by the survey is that purchasers sometimes get caught up in the technology: they become so caught up with what the equipment is capable of doing, they lose sight of what they wanted the equipment to do, or what the business needs from that equipment. In effect buying a Cadillac, when a Chevy will do.

While computer automation is unlikely to save money, if careful attention is given to planning and training computer automation can:

- Make a business more effective.
- Make a business more competitive.
- Improve employee satisfaction.

This booklet will not say much about computer technology. It will say a lot about:

- Determining your business needs. (Chapter II)
- Selecting your best computer system. (Chapter III)
- Implementing your computer system. (Chapter IV)
- Operating your computer system. (Chapter V)

Throughout this booklet, you may see unfamiliar words or phrases dealing with computers and computer automated systems. Appendix B lists the more common words or phrases.

CHAPTER 1

DETERMINING YOUR BUSINESS NEEDS

"Can you afford not to buy a computer?"

Computers are a tool. Like any tool a computer, by itself, will not solve your business problems. A computer can, however, provide automated support and assistance to you in providing a solution to your business problems. A potential benefit from automation occurs among the following common business needs:

BENEFITS OF COMPUTER AUTOMATION

- **Accounting**
  - You have delays in invoice preparation
  - You sometimes ship goods without invoices
  - Your control of outstanding accounts receivable is weak
  - You write off too many accounts as bad debts
  - Your accounts payable is not organized
  - You miss opportunities for early payment discounts
  - You incur late payment penalties
  - You miss opportunities for tax reduction
  - You have weak fixed assets accounting controls
- **Customer Services**
  - Your customer orders are delayed
  - You have excessive paper work
  - Your outstanding customer order information is not readily available
- **Inventory**
  - You have frequent inventory shortages
  - You carry many expensive slow-moving items
  - You cannot easily reconcile inventory records against sales and receipts
- **Personnel**
  - Your clerical overtime expenses are excessive
  - You have high clerical staff turnover
  - You are suddenly hiring more staff
- **Production**
  - Your product prices do not keep up to component cost changes
  - You do not know your labour and staff requirements over the next 30 days

- **Management**

  - You do not have up to date financial information
  - You cannot easily determine your profit margins on individual product lines or projects

Experiencing some or any of the above situations does not guarantee that computer automation is the prime solution. Improved manual methods, reorganization of the business or improved management techniques may be alternative solutions.

Regardless of your business problem it is likely there is a computer application available. A list of computer applications may include:

APPLICATIONS

- Accounting, general ledger, summary reports
- Bill of materials processing
- Cost planning
- Drafting, design
- Engineering
- Financial planning and analysis
- Graphics, business
- Hotel/motel management
- Inventory control systems
- Job performance measurement
- Legal management administrative systems
- Manufacture scheduling
- Marketing analysis
- Network design
- Office automation
- Plant/equipment maintenance
- Quality control
- Report writers
- Restaurant systems
- Scheduling, manufacturing
- Time management
- Utility billing
- Vehicle maintenance
- Warehouse management

You may find lists of applications in software directories available in libraries and/or a computer specialty store.

CONSIDERATIONS

If you decide to investigate whether a computer system will benefit your firm, you have three questions to consider:

- What do you want to do?
- Why do you want to do it?
- How will you do it?

A. WHAT DO YOU WANT TO DO?

This is your first and most important step. This is where you set your goal.

Do you want to solve existing problems as listed in the beginning of this chapter? Do you want to reduce your business operating costs? Do you want to upgrade your business application power in such areas as accounting, budget modelling, or graphics?

These and others are valid reasons to consider computer automation. Regardless, the goal you choose will affect the types of computer automation you will need and how you will implement it.

B. WHY DO YOU WANT TO DO IT?

Of course you want your business to be competitive and profitable. What you are doing in this stage is asking yourself why your selected goals came about.

Do you know why your accounting system is inadequate? Do you know why you have excessive operating costs? Do you know why you have frequent inventory shortages? Do you know why you have poor graphics capabilities?

What you are doing by asking why is trying to avoid automating your existing problems. Unless you know why your current problems exist, you should not proceed any further. Organizations that try to solve operational problems solely by adding new technology will only add complexity to their existing situation.

C. HOW WILL YOU DO IT?

You know what your goals are and you know why those goals have come about. What you must now decide is how to achieve your goals in a business-like cost effective manner.

Should you replace staff? Should you hire more staff? Should you revise your operational methods? Should you computer automate?

This process of examining what you want to do, why you want to do it and how you will do it is often called an advisability study.

ADVISABILITY STUDY

An advisability study examining computer automation for your business should:

- Identify the strengths and weaknesses of your current operations with emphasis on bottlenecks and duplication of effort in areas where information reporting is inadequate.
- Identify information needs, that is, who needs what information where and when.
- Identify alternatives for improving the weaknesses. Alternatives should include improved manual methods and use of third party services as well as computer automation.
- Identify the planned or potential changes to your business.
- Calculate the costs of your current procedures and estimate the cost and savings for each alternative.
- Identify the intangible effects such as staff morale or consumer satisfaction for each alternative.
- Review results and highlight those areas where the greatest improvement may be made.

When properly done your feasibility study should lead you to answers, not to predetermined answers. In Appendix A you will find an outline for an advisability study.

CHAPTER 2
SELECTING YOUR COMPUTER SYSTEM

WHERE TO BEGIN

"There are three rules of computer system purchase:

Rule 1: Start with the software
Rule 2: Start with the software
Rule 3: Start with the software"

There are three steps when buying or leasing a computer system:

1. Select the software.
2. Select the peripherals (e.g. printer, cables, modem, etc.)
3. Select the hardware.

At each step some specialized knowledge or experience is necessary to make informed decisions. There are a variety of courses and training programs offered by vendors, schools, government agencies, etc. You are well advised to take advantage of these programs if you do not have some understanding of computer systems.

In addition, many consulting firms have specialists trained to evaluate and recommend appropriate systems.

SOFTWARE

A. SELECT THE SOFTWARE

A software package consists of the programs that instruct your computer to do specific tasks such as financial management or inventory control. You should therefore select your software as if your business depends upon it.

Your checklist on software selection will include the following points:

What do you want to do with your computer? List the applications you need in order of importance (see Chapter II). Evaluate each of the applications as you perform them now and decide whether you would like the computer to do it faster, cheaper, or more accurately. Some basic small business applications will include accounting, word processing, financial planning, data base management, mailing lists, estimating or job costing, communications and graphics.

What type of business are you in? There are specialty software packages for most kinds of businesses. These specialty packages may include all or some of the previously listed applications.

Are the software packages integrated or interfaced? Your previously stated applications may all be available on one package. That is, the package is integrated.

On the other hand, the applications might be on separate programs in which case you will need to know whether one package can pass data to another. That is, they are interfaced.

For example, you may have a word processing, general ledger and accounts payable programs. Do you want these programs to read each other's data files?

Some integrated packages try to do too many things. The result is that each application is not as complete as when compared to a single application or program.

How much business do you do? Computer space is not infinite. You may have a large number of customers or items on inventory. Will your application programs be able to handle the amounts of data you intend to send through it?

How computer literate are you? Some software packages require little skill to properly operate. Others may require your taking a course. Sit down and try using the package before you decide to buy it.

Do you understand the manual? Is the manual written in plain English rather than "computerese"? As you sit down and play with the software can you follow the manual instructions?

Do you need training? You may decide after examining the software package and its manual that you and your staff need training. Is such training available both now and in the future? Will the instructor(s) come to your business? How much time will they spend?

Are you going to be supported? When you are buying the software you are also buying a relationship with the dealer? Will the dealer set up your system and show you how to start it? Will he have someone on hand to help you solve any problems with the system? Is the dealer an established firm which will be around several years after you purchase the software?

What do others think? Your best test for software is the number of satisfied users. Will the dealer provide you references? What do your competitors use? You can also go to your library and check the computer magazines for any reviews or ratings of the software in question.

The warranty. Does the dealer stand behind the software? Is there a disclaimer written on the software package?

Price. There is no such thing as cheap software. You may think that you are saving money by selecting a cut-rate or bootleg

software package. However, your business will lose money if you find that there are problems with the software and there is no warranty or dealer support to back you up.

Unregistered possession of some software packages (bootleg) is illegal. Other software packages (free ware) may be freely copied but tend to have limited applications.

All of these points deal with off-the-shelf programs which are the best choice for 95% of all users. If you find that you are the 5% whose needs are not met by commercial software packages, you have two other choices:

- Buy custom made software.
- Write your own software.

Whichever of these latter two options you choose, you should know that it will be time consuming and expensive.

PERIPHERALS

B. SELECT THE PERIPHERALS

Peripherals are your attachments to the computer. Your two most common kinds of peripherals are:

- Printers
- Modems

1. Printers

Software packages, especially the word processing ones work best with certain printers in mind. Therefore you must choose your software before you choose your printer.

When selecting a printer you are considering these criteria:

- **Volume**

-What will be your average weekly use? Will you be running the printer constantly all week or only on one day? Occasional bursts of heavy work won't hurt a printer but consistent heavy use may lead to expensive repairs.

- **Quality**

-Quality will vary with the type of printer. The lowest quality will come from dot matrix printers, the highest from the laser printers. The least expensive printer tends to be dot matrix; the most expensive, the laser.

-Most businesses tend to use dot matrix printers for their proven reliability and relatively inexpensive cost. Their print quality has improved over the past number of years.

Laser printers are the printers of choice for those businesses who require high quality output.

If you require colour, be prepared to pay a lot of money.

-Your dealer should provide examples of the type of output your business will produce.

- **Speed**

-Different printers will operate at different speeds. Printer speeds are rated at CPS (characters per second). In general 15 CPS will equal 180 words a minute or 15 lines a minute (based on 5 characters per word and 10 words per line).

-Most manufacturers tend to rate their printers at optimum speed, that is, the fastest possible velocity when the same character is printed repeatedly. Therefore in the actual office environment the printer speed will be much slower because of the variety of characters being printed. Printer speeds then, tend to be most useful for comparison purposes among printers.

Dot matrix printer speeds are usually quoted as Draft/NLQ (e.g. 100/45). This means that the poorer quality draft sheet will be printed at 100 cps, while the higher letter quality or near-letter-quality (NLQ) sheet will be printed at 45 cps.

- **Paper handling**

There are two main kinds of paper handling systems:

i) Tractor feed — uses continuous form paper and is most useful in printing labels or pre-printed forms such as invoices.

ii) Sheet feed — is the preferred system for word processing and report production. Though usually more expensive, sheet feeding systems tend to be faster and more efficient especially when dealing with large volumes of paper.

Both systems are available with variable paper widths.

Whichever system you prefer, make sure that your existing forms, letterheads, invoices, etc. will feed properly through the printer before making any purchase.

- **Support**

-Will your dealer set up your printer and show you how to use it? Generally, the more capable (and expensive) a printer is, the more difficult it is to set up. Will the dealer provide a maintenance contract? Is the dealer an established firm which will be around several years after you buy the printer?

- **Warranty**

-Does the dealer support the printer?

- **Price**

-Along with the printer's purchase price, you will have several additional costs. These will include the connecting cable

(to your computer), paper, ribbons or toner. There may also be regular maintenance costs for the more expensive models.

2. Modems

Modems allow computers to communicate over telephone lines as a way of sending messages and documents between offices and cities. They are faster, cheaper and more reliable than the post office, courier services, the telephone and fax machines. You may also purchase access to various electronic data base services such as Info Globe Mead Data and QL Systems.

Modems are graded on the basis of transmission speed which is expressed in baud. Baud rates will range from 300 to approximately 9600. Most modems operate at 2400 baud. 300 baud is roughly equal to 30 characters per second or 360 words per minute.

HARDWARE

C. SELECT THE HARDWARE

Having selected your software and peripherals, you can now match their needs with the hardware. That is, the computer itself.

You will be dealing with two main types of computer systems: IBM and Apple. Together they dominate the computer market. Software, printer and other computer manufacturers know this and often design their products to be compatible with one or the other.

Of course there are other equally fine computer systems, but due to their smaller market share, there will also be a smaller choice of software, printers and dealers available.

When buying a computer you must consider the following:

Will your software work? Computer software tends to be designed with a particular operating system in mind. That is, each program will only work on a few computers.

How compatible is the clone? Many computers that are offered today are "clones" or look-a-likes to brand name computers such as the IBM PC, XT and AT. The only way to ensure compatibility (100% fit) is to try out the various software packages you will be using on the clone. You should speak with existing clone-owners to benefit from their experiences.

Will your printer work? You can configure your computer to most printer models. But there may be exceptions. You must also make sure that the cables provided will connect your computer to your printer.

What speed do you need? Computers are rated on their speed and as a general rule, faster computers cost more. Speed is important if you have large volumes of data to process or complicated/complex systems.

How much memory do you need? Computers use two types of memory; RAM, short for random access memory and ROM, short for read only memory.

The contents of ROM are the instructions read by the computer. They are permanent and cannot be changed and need not necessarily concern the buyer.

More important is RAM. RAM is the computer's, that is your, working area. RAM size will be expressed in kilobytes (K).

It is difficult to translate memory size to volume output but very roughly, one byte will equal one character. Therefore, a manual this size probably occupies about 50K of memory (based upon 5 characters per word, 10 words per line, 30 lines per page). Common RAM designations are 256K and 640K. Computer memory may also be expanded.

How much storage capacity do you need? You have two ways of storing information: on floppy disk or on a hard disk (a hard disk may be either inside or outside the computer).

Storage capacities are expressed in either kilobytes or megabytes. A megabyte (Mg) is about 1,000 kilobytes. Most computers will have a hard disk capacity of 20, 40 or 80 megabytes.

The storage capacity of floppy diskettes, however, is much smaller. The 5 1/4 inch floppy diskettes will have a storage capacity of 360K or 1.2 Mg. while the 3 1/2 inch floppy diskettes will have a storage capacity of 720K or 1.44 Mg.

You can expand up to a point, the storage capacity of most computers.

What are the specifications? All computers have specifications for: line voltage, frequency, power, operating temperature, storage temperature, relative humidity and altitude.

How are the ergonomics? Ergonomics is a fancy word for the study of the interaction of people and machines. Is this machine satisfactorily designed for yourself and other people? Do you like the screen size and colour? Are you comfortable with the keyboard's configuration?

Do you understand the manual? Is the accompanying manual written in plain English rather than "computerese"? As you sit down and work with the computer can you follow the manual explanations?

Are you going to be supported? When you are buying a computer you are also buying a relationship with the dealer. Will the dealer set up your computer and show you how to operate it? Will he have someone on hand to help you solve any problems with the computer? Is the dealer an established firm which will be around for several years after the purchase?

Do you need training? You may decide after examining the computer and its manual that you and your staff need training. Is such training available both now and in the future? Will the instructor(s) come to your business? How much time will they spend?

What do others think? Like software, your best test for hardware is the number of satisfied users. Is this an established manufacturer of the hardware? Will the dealer provide you references? What type of equipment does your competition use?

Warranty. Does the dealer stand behind the hardware? Will he provide a maintenance contract?

Price. Computer systems, like cars, often have a base price and, when you add up the features, a much higher price. Your typical computer system cost will include the following points: hardware (includes monitor, disk drives, memory and keyboard), software, printer and cable, other peripherals such as a modem, shipping charges, installation charges, maintenance contract, supplies such as diskettes and printer ribbons, and training.

Make sure you are comparing identical systems when comparing price.

You may also include in this list other possible hidden costs such as desks, chairs, interior redesign of your office, and maybe new power outlets.

CONSIDERATIONS

D. OTHER CONSIDERATIONS WHEN SELECTING YOUR COMPUTER SYSTEM

1. A demonstration

You have selected your software, peripherals and hardware. You may have several options among these choices. Your final step is a demonstration.

Take samples of all your word processing and data processing work you expect your new computer system to do and ask the dealer to show how they can be handled.

Using this demonstration package will not only assure that the machines will do their required work; it is also a way of comparing different manufacturers on the same basis.

In other words, try to see a small example of the type of work your business will be doing on the computer system before you actually buy that computer system.

2. Your request for proposal

A common way of providing prospective computer suppliers with a clear statement of your needs together with the information they need to make the best proposal possible is the Request for Proposal (RFP). In Appendix C is a sample outline of an RFP.

3. An in-house computer system

Some advantages

The advantages to an in-house computer system are:

Scheduled flexibility — you do your work when you want to.

Business procedures flexibility — you adapt your computer system to fit your unique business procedures.

Low cost expansion — you may process increasing volumes of business with marginal increases in cost.

Data security — you keep control over your business data and its confidentiality.

Some disadvantages

Some disadvantages to an in-house computer system are:

Capital outlay — whether purchased or leased, your net effect is a reduction of capital which could otherwise be used for business opportunities.

Leasehold and operating overheads — your in-house computer may require leasehold improvements (a separate room, air conditioning, electrical work, etc.). Operating overheads such as computer maintenance, supplies, insurance and staff training.

Obsolescence — your in-house computer will eventually become obsolete.

4. Using a computer service bureau

Service bureaus provide an alternative to owning or leasing a computer. Some service bureaus operate large general purpose

computers and provide general business data processing services to a variety of clients. Other service bureaus are more specialized, offering one product to many industries (i.e. a payroll service bureau) or a complete business service to a specific industry (i.e. automobile dealers, travel agencies, insurance agents).

Some advantages

Some advantages to service bureaus are:

Processing flexibility — large service bureaus have the processing capacity to meet peak demands of many clients. This is very important if your business experiences large cyclical variations in business volumes or periods of high growth.

Fee for service — most service bureaus charge on a "pay as you go" basis although some charge a subscription or minimum monthly fee. This can be attractive if your business requires only occasional services or draws significant variations in business volumes.

In-depth knowledge — depending upon the service you need, service bureaus can provide the specialized knowledge required for a specific industry or service product.

Economies of scale — very large data bases can be economically justified only by large service bureaus which share the costs of maintaining these data bases among many clients.

Some disadvantages

Some disadvantages to using service bureaus are:

Premium prices — service charges may be relatively high when compared to operating a purchased or leased computer.

Remote operations — many service bureaus require their clients to forward source documents or prepare quoted forms for subsequent processing. The source or quoted documents are then returned to the client with the printed reports. Such remote operations may impose scheduling restrictions and time delays on your business.

Operating time — the smaller the business the less control over operating times. Many service bureaus will "bump" a smaller client down their scheduled list of tasks in consideration of a larger client.

You may mix the advantages of in-house computers and service bureaus. For example, your business could use an in-house computer for day-to-day business data processing and a service bureau for specialized computing.

CHAPTER 3

IMPLEMENTING THE SYSTEM

"Plan your work or your plan won't work".

PLANNING FOR THE FUTURE

Like any journey you must know your destination before you plan your route. Similarly you must visualize the effect that computer automation will have on your business before you implement that automation.

One of two things may happen when you computer-automate your business:

You and your support staff will increase your daily output without fundamentally changing the manner in which your office operates.

Your office will fundamentally change in how it operates.

Whichever direction you visualize your office going, your best first step is always to keep your original office organization and allow yourself and the staff to use the computers and learn their capabilities. Since there will be little change in the way things are done in your office, it is much easier to introduce computers using this approach.

IMPLEMENTATION PLAN

Once you have become comfortable with the new technology, then you can begin rethinking how to organize your office and attack the traditional bottlenecks in office procedure and information flow. With this general approach in mind, your implementation plan should have the following points:

Tell your staff what is happening. Your success depends upon the cooperative efforts of all your staff. By keeping them informed and involved you are more likely to identify and deal with small concerns before they become big ones.

Organize and bring up-to-date all your records. You will ease the burden of conversion, and provide a good basis for verifying the correctness of a new computer system.

Undertake a training program. You should familiarize yourself and your staff with the new system and its procedures. This will make your start-up easier and assist in system maintenance.

Order any required computer supplies well in advance. This will include your printer ribbons, spare diskettes, magnetic tapes or computer forms. Also you may have to re-print any special pre-printed forms such as invoices, cheques or letterheads.

Prepare your office for the installation. Your office changes may be as simple as rearranging desks or as complex as installing special electrical work, air conditioning or providing for a separate room.

Install a tested computer system. Your preliminary tests should cover all functions of the system as well as seldom used functions such as year-end closing. In the meantime, do not discontinue using the manual system until everything in the computer system is working correctly. If you have several applications you should test and implement each application one at a time. The order should follow a logical sequence. A phased implementation can reinforce training and avoid confusion.

Document your implementation. As you go through your implementation, step by step, keep a diary of events. This diary is important as you review your progress. This diary will also be necessary as a back-up if there is any staff turnover during the implementation.

Revise your draft procedures manual. Your new manual should reflect the operational capabilities of the computer system rather than your old manual system.

Take stock of what you have done. Once you have implemented your computer system and operated it for several months, examine whether you achieved your expected results. Review again your revised procedures manual to assure that proper controls have been incorporated and also consider whether there are possible ways in the future to make the system more effective or cost efficient.

This final point is your optional stage 2 where you begin to rethink how your office should operate.

Any fully automated office uses computer technology in two fundamental ways:

- Individual tasks are automated.
- Communication is automated.

Most small businesses instinctively understand automating individual tasks. Word processors are faster and more efficient than typewriters. With electronic spreadsheets, budget preparation and financial modelling replace manual preparation. Data is filed and retrieved from diskettes rather than filing cabinets. Telephone numbers and appointment schedules are kept electronically.

Electronic communication on the other hand may involve executives writing their own letters on the computer and then feeding them to the secretary for final preparation and mailing. Reports may be circulated among the department electronically with comments or amendments. Managers can monitor operations by logging into the database rather than calling up the individual in charge. Instead of playing telephone tag, you may receive and reply to notes electronically.

The irony of office automation is that the senior executive is often the last person in the company to tie into the new system.

The main reason is that until the rest of the company is up and running on computers, it is not an appropriate tool for the boss. The other reason is that some business owners may not be as committed to computer automation as they say they are. Business owners, who along with their staff, take a computer or software training course usually begin to recognize new possibilities in computer automation.

This is fortunate since many companies, by keeping an open mind and adhering to the potential of computer automation, often begin by importing the technology to solve a specific bottleneck — then discover a whole new way to run their office and their business.

CHAPTER 4

OPERATING A COMPUTER SYSTEM

"Computers are conscientious idiots. They cannot think. They only follow orders issued by people who (knock on wood) can think."

RULES

A well implemented computer system can be quite simple to manage and operate if some fundamental rules are followed. These rules are common business sense:

Maintain a procedures manual. Every system has some weaknesses but effective controls can compensate and minimize the potential for error. When procedures change, the manual should be revised. Train yourself and other key staff in the various operating procedures. This will reduce disruptions during periods of employee holidays, sickness or turnover.

Maintain back-ups of data and program files. To safeguard against loss or theft, keep copies of data files in a safe place. The data files should be backed up regularly. As well, keep at least one back-up copy of software in a fire proof location other than the office. You should keep a manual record of all back-up copies in a safe place. Always remember, lost software may cost you thousands of dollars; lost data may cost you a client or your business.

Maintain security. Access to your computer system should be restricted only to those who are authorized to use it. Confidential system data either stored in the computer system or printed on reports, should be "secured" against disclosure. Some computer software packages have a password system.

Incorporate good audit trails. Visible records of all transactions which change data whether entered manually or generated automatically should be produced and retained in a safe place. Computer recorded transactions should be supported by source documents. Periodic reviews and audits of the computer system should be conducted.

Follow proper maintenance procedures. A computer is a machine. Therefore it must be maintained. It should be kept clean and the temperature kept at a safe operating level. Electrical power supply should be maintained at a satisfactory level. To protect against dust and other foreign particles, ensure that the area in which your computers are kept is well ventilated. Do not allow smoking, food or drink near a computer.

Have a comfortable work area. The common complaints among people who work with computers are: eye strain, blurred vision, dizziness, and sore neck, back and legs. The work area should be well lit. The seating must be comfortable. The computer should be set at a comfortable level and distance from the operator. There should be no glare on the screen. To prevent eye

strain, the computer should be away from a wall. Operators will then be able to look up and readjust their eyes from time to time.

Have a maintenance contract. Preferably with the computer supplier, maintenance contracts generally include preventative as well as ongoing maintenance. Maintenance services beyond normal working hours often have a premium charge. Additional coverage may be important if the computer system is critical to the success of your business. It may also be necessary to contract for software maintenance for at least one year after your system is installed. The software such as a payroll system may require changes due to circumstances beyond your control.

Insure your equipment. Computers are valuable pieces of equipment. Insure them against fire, theft or any other damage.

Nothing stays the same. Your business will evolve. Anticipate the effects on your computer system caused by your business changes. If your business experiences significant growth, you will most likely have to expand the capacity of your computer system by adding memory, disk storage, terminals or printers as required.

APPENDIX A

OUTLINE OF AN ADVISABILITY STUDY

EXHIBIT A-1
Advisability study

Chapter		Content	Comments
1	BUSINESS PROBLEM STATEMENT		Description of concerns and problems that exist.
	A	*Problem scope*	Identification of the boundaries of the problem to ensure that specific problems are being addressed.
	B	*Problem impact*	Determination of the specific impacts of the problem — usually expressed as costs or lost revenue.
	C	*Intangibles*	Statement of the non-quantifiable impacts (if any) such as: poor staff morale, poor quality information, bad customer relations.
2	EVALUATION CHECKLIST		Description of the factors and approach to be used to screen choices.
	A	*Software features*	Statement of the most important features and functionality that are required in the package.
	B	*Hardware features*	Statement of the needed and highly desired capabilities of the hardware.
	C	*List of candidate solutions*	A list of software and hardware packages that could possibly be used to solve the business problem.

Chapter	Content		Comments
3	POTENTIAL SOLUTIONS		Identification of various choices which provide a solution to the problem.
	A	*Business utility*	A review of each alternative, comparing the cost of the alternative with the potential benefit.
	B	*User utility*	A review of each alternative to determine how well this solution solves the business problem.
	C	*Technical utility*	A review of each alternative to determine if the technology used is appropriate. That is, will the software and hardware work well together? Also, if the equipment is a clone — is it truly compatible?
4	ADVISABILITY RESULTS		A summary of the steps of your study.
	A	*Study results*	Statement of the study results that should make it easy to decide to proceed or not proceed.
	B	*Study conclusions*	A statement of your decision. You should document your conclusions and refer back to them as you proceed to select a system and subsequently implement and operate the system.

APPENDIX B

GLOSSARY OF TERMS

Application — a program, or set of programs, designed to perform a particular task (as in information retrieval, word processing, data analysis).

Back-up — a copy or copies of computer information made in anticipation of loss, theft or computer failure.

Bit, Byte, Kilobyte, Megabyte — storage capacities in a computer

8 Bits	=	1 Byte
1,000 Bytes	=	1 Kilobyte (K)
1,000 Kilobytes	=	1 Megabyte (Mg)

1 - 5 1/4" (double-sided) floppy diskette = 360 K or 1.2 Mg
1 - 3 1/2" (double-sided) floppy diskette = 720 K or 1.4 Mg

This page would occupy about 3K of memory.
This manual would occupy about 50K of memory.

Central Processing Unit (CPU) — the heart of a computer. It carries out all the arithmetic, logic and control operations of a computer and its peripherals.

Clone — a brand-X computer that is designed and manufactured to operate in a similar fashion to a popular name brand product. Compatibility or degree-of-fit can vary widely from one clone to another.

Computer Graphics — the input, construction, storage, retrieval, manipulation, alteration and analysis of pictorial data.

Compatibility — the ease with which a computer program (applied to either a hardware or software system) running on one machine may be made to run on another machine.

Computer Service Bureau — a facility, usually commercial, which allows a computer user to lease time on a central processor and appropriate peripherals to run his/her program.

Communications Software — computer programs designed to transmit and receive data using telecommunications facilities such as the telephone system.

Convertibility — the ease with which data running on one type of software and operating system can be translated to another type of software and operating system.

Cursor — A light indicator on a display screen, which shows where the next character is to be generated. The cursor can be moved across the screen by use of a key on the keyboard.

Database — a store of data on files which can be made accessible to a computer, often used in connection with an information retrieval system.

Disk — a form of backing storage. It consists of circular plates with magnetizable surfaces which possess a number of recording tracks.

Feasibility Study — an examination of a function which determines the technical and financial implications of changing the function in order to improve it.

File — refers in general, to any organized and structured collection of information. The data in such a collection are organized into items, and structured so as to facilitate the type of access required.

File Server — a combination of software, hard disk(s) and computer that allows users to store and share information and applications over a network (see Local Area Network).

Fixed Disk — a disk memory in which the recording surfaces remain permanently within the drive unit.

Floppy Disk — a disk made of a flexible material, e.g. plastic, coated with a magnetic surface. Such disks are relatively cheap to make and easy to handle, but they have more restricted storage than a hard disk.

Hard Disk — a magnetic disk with rigid plates, used for bulk storage of computer data. Hard disks offer much larger storage capacities than floppy disks and data transfers are much faster.

Hardware — the mechanical, magnetic, electronic and electrical devices which make up a computer.

Interface — used as a general term to describe the connecting links between two systems. The term most frequently refers to the hardware and software required to couple together two processing elements in a computer system.

Local Area Network (LAN) — a collection of interconnected, individually controlled computers and peripherals, together with the hardware (file server) and software to connect them.

MS-DOS — short for Microsoft Disk Operating System. An operating system specified for an IBM or compatible computer.

Manual Procedures — documented activity steps which are required to be performed in order to manage, control and operate a function.

Memory — a device into which information can be introduced and stored for extraction by a computer when required. Central memory is the memory within the central processing unit. Auxiliary memory devices include magnetic disk and tape.

Modem — a device which allows computers to communicate over telephone lines and thus send messages and documents between offices and cities.

Office Automation — the organization of an office to collect, communicate, compute, control and co-ordinate information using a computer system.

Operating System — software contained in a computer which allows it to control the sequencing and processing of programs, and so respond correctly to user requests, e.g. to store a file of data, to compile and run a program.

ProDOS — short for Professional Disk Operating System. An operating system specified for an Apple or compatible computer.

Peripheral — a device under the control of a central processor. It may mean a modem, a printer or external hard disk.

Program — an ordered list of instructions directing a computer to carry out a desired sequence of operations. The objective is normally the solution of a problem.

Programmed — a computer is programmed by loading a set of instructions in its memory.

Programmer — a person who writes programs.

Removable Disk Pack — a magnetic disk which may be removed from the disk drive unit, thus permitting quick replacement of large amounts of data available to the computer.

Software — the instructions, programs, or suite of programs which are used to direct the operations of a computer, or other hardware.

Software House — a commercial organization which specializes in writing software (computer programs) for clients.

System — an organized set of components (human beings, equipment, software, etc.) which interact in a regulated fashion.

System Software — a general term covering operating systems and system utilities.

System Utilities — a set of programs used to perform common functions which support computer operations. Examples include back-up/restore programs, disk formatting programs and file copy programs.

Systems Analyst — a person who analyzes systems, and determines the scope for improved efficiency through the introduction of computers and new information technology.

Tape/Cassette Tape — a form of backing storage, consisting of reels of plastic tape coated with a magnetic oxide. Data are entered and accessed by means of read/write heads past which the tape is wound from one reel to another.

Turnkey Package — a complete computerized system installed by a single supplier, who takes responsibility for the production, installation and operation of all the hardware and software. 2 - a system in which the user does not need to know any programming or operating system commands, e.g. loading programs. When turned on, the system goes into a preprogrammed activity, e.g. word processing or information retrieval.

User — a person who operates a computer for direct benefit or one who receives processed information from a computer.

Value Added Remarketer (VAR) — a commercial organization which combines software with purchased hardware and subsequently sells and supports the package.

Word Processor — a system which provides advanced text editing functions, capable of storing and managing large volumes of text, applying changes and preparing printed documents.

APPENDIX C

OUTLINE OF A REQUEST FOR PROPOSAL

A. YOUR REQUIRED SKILL SETS

The person(s) selecting your computer system should have the following skill sets:

Authority — this person takes overall responsibility for the project and provides the credibility that will be necessary to obtain solid commitment from all levels of your business and high levels of response from any vendor.

Supervision — this will be the person who on a day-to-day basis will be supervising the use of any computer automation system.

Application — this will be the person(s) who will be using the computer system. The number of people involved at this level will match the number of computer applications you are interested in; that is, if you have separate people operating the word processing and accounting systems, then have those two people involved in your committee.

The importance of including the last skill set is that these are the people who are directly responsible for your decision; that is, they are the ones who are going to make your computer system work. You in the long run will only have to pay for it.

Together you and your group will put together a request for proposal and identify your most likely vendors. Ideally, you should issue your request for proposal to five or six vendors. A larger number tends to be unwieldy and a smaller number may not provide a proper range of comparative proposals.

Your request for proposal will be structured in the following manner as shown in Exhibit C-1.

EXHIBIT C-1
Request for proposal

Chapter	Content		Comments
0	Title page		State your firm's name, RFP title, date prepared.
I	INTRODUCTION		
	A	*Purpose of RFP*	Describe the general purpose of the RFP and provide some general background of your firm's needs.
	B	*Your business*	Describe your business. Include some general information such as staff size, business volume, market area, office locations, etc.
	C	*Computer requirements*	State in summary form. See Chapter 2 — what do you want to do?
	D	*Key dates*	State the key dates (issue, bidders' conference, office tour, proposals due, likely decision, desired implementation).
II	REQUIREMENTS		
	A	*General requirements*	State the applications and likely configuration (no. of computers, printers, hookups, etc.) needed.
	B	*Specific requirements*	State the need for each application area in detail, including performance criteria.
	C	*Volumes*	State the volume of work anticipated.

EXHIBIT C-1
Request for proposal

Chapter		Content	Comments
III	PROCEDURE		
	A	*Administration*	State the tendering process (procedures, contracts, schedule).
	B	*Proposal format*	State how you expect the bidders to respond (structure, layout and content of proposal, number of copies).
	C	*Selection*	State how you intend to evaluate and short list the bidders. State your key evaluation criteria.
	D	*Preliminary contract terms*	State the key terms and conditions terms you expect bidders to accept in the contract.

APPENDIX D

A CHECKLIST FOR SELECTING A SMALL BUSINESS COMPUTER SYSTEM

The following checklist summarizes the steps to be followed in identifying your business needs, analyzing the acquisition of a computer system to meet those needs and the process of selecting the appropriate software and computer.

Checklist Steps	Who Should Do It
I DETERMINING YOUR BUSINESS NEEDS	
1. Recognize that a problem or need exists	
2. Clearly state the problem or need	
2.1 Set the scope of the problem or need	
2.2 Determine the impacts of the problem or need on your business	
3. Conduct an advisability study	
4. If advisable to computerize, document how you anticipate the system will solve your problems or needs	
II SELECTING YOUR COMPUTER SYSTEM	
1. Write down your requirements	
1.1 Identify the "system" you want to automate	
1.2 Document the functions and features you require	
1.3 Identify the types and quantities of peripherals you need	
1.4 Describe the hardware features you want	

Checklist Steps	Who Should Do It

2. Search for potential vendors

    2.1 Make a list of potential vendors
    2.2 Decide if you are going to use an RFP
    2.3 If you do, prepare the document and forward it to potential vendors
    2.4 If not, approach vendors with your list of requirements

3. Make a selection

    3.1 Prepare a list of "evaluation" factors to compare and rate each vendor's offering
    3.2 Evaluate the vendor proposals or offerings
    3.3 Select a vendor
    3.4 Negotiate a deal

III IMPLEMENTING YOUR BUSINESS NEEDS

1. Assemble your implementation team

2. Develop your implementation plan

    2.1 State the activities involved
    2.2 Schedule each activity
    2.3 Define the resources required
    2.4 Establish training requirements

3. Follow your implementation plan

4. Assess the results of your implementation plan

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Printed in Canada